

Patent Claims

1. Device (1) for the precise machining of material (90), in particular organic material, comprising a pulsed laser system (10) with a beam source (15)
characterized in that
a cavity-dumped fs oscillator (11) is provided as beam source.
2. Device according to claim 1
characterized in that
beam apparatuses (20) are also provided for beam formation (21) and/or beam guidance (22) and/or beam deflection (23) and/or beam focusing (24).
3. Device according to claim 2
characterized in that
the beam apparatuses (20) are programmable.
4. Device according to one of the previous claims
characterized in that holding devices (30) are also provided for positioning (31) and/or fixing (32) the material (90) to be machined.
5. Device according to one of the previous claims
characterized in that
laser pulses of 100 nJ to 100 μ J, preferably 1 μ J pulse energy are able to be provided by the cavity-dumped fs oscillator (11).
6. Device according to one of the previous claims
characterized in that
laser pulses with repetition rates from 10 kHz to 10 MHz are able to be provided by the cavity-dumped fs oscillator (11).
7. Device according to one of the previous claims

characterized in that

a working beam of the beam source can be applied by the beam apparatuses (20) to the material (90) in geometrically predeterminable forms in a chronologically predeterminable course.

8. Device according to claim 7,
characterized in that

the pulsed working beam can be applied to the material by the beam-deflection apparatus (23) and the repetition rate is able to be modified during this.

9. Method for the application of a laser beam of fs pulses of a cavity-dumped fs oscillator beam source to a material, in particular an organic material, characterized in that
the cohesion of the material is destroyed in the focus of the laser beam by means of photodisruption.

10. Process according to claim 9,
characterized in that

the pulsed laser beam is steered onto the material to be machined by means of a deflection apparatus and the repetition rate of the pulses of the laser beam is modified in relation to the spot pattern produced hereby on the material.

11. Use of a device according to one of claims 1 to 7 for refractive surgery.